A transportation management system (TMS) requires a database schema that efficiently stores information about transport requests and their associated vehicle assignments. This typically involves several related tables that manage the lifecycle of a transport job, from initial customer request to final vehicle allocation.

Core tables

Transport\_Requests

This table holds the master record for each transport job requested by a customer.

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Constraint | Description |
| request\_id | INT | PRIMARY KEY | Unique identifier for each transport request. |
| customer\_id | INT | FOREIGN KEY | Links to the Customers table. |
| request\_date | DATETIME | NOT NULL | Date and time the request was placed. |
| pickup\_location | VARCHAR(255) | NOT NULL | The starting address for the transport. |
| delivery\_location | VARCHAR(255) | NOT NULL | The final destination for the transport. |
| required\_delivery\_date | DATETIME | NOT NULL | The requested delivery date and time. |
| status | VARCHAR(50) | NOT NULL | Current status of the request (e.g., "Pending," "Assigned," "In Transit," "Delivered"). |
| notes | TEXT | NULL | Any additional comments or instructions for the request. |

Vehicles

This table contains a record for every vehicle available in the fleet.

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Constraint | Description |
| vehicle\_id | INT | PRIMARY KEY | Unique identifier for each vehicle. |
| license\_plate | VARCHAR(50) | UNIQUE, NOT NULL | The vehicle's registration number. |
| type | VARCHAR(50) | NOT NULL | The vehicle type (e.g., "Truck," "Van," "Bus"). |
| capacity | DECIMAL(10,2) | NOT NULL | The vehicle's carrying capacity. |
| status | VARCHAR(50) | NOT NULL | Current status (e.g., "Available," "In Service," "Under Maintenance"). |
| driver\_id | INT | FOREIGN KEY | Links to the Drivers table for the primary driver. |
| make | VARCHAR(50) | NOT NULL | The vehicle's manufacturer. |
| model | VARCHAR(50) | NOT NULL | The vehicle's model. |

Vehicle\_Assignments

This is a junction table that connects a specific Transport\_Request to a specific Vehicle, often including information about the route and the assigned driver.

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Constraint | Description |
| assignment\_id | INT | PRIMARY KEY | Unique identifier for each assignment. |
| request\_id | INT | FOREIGN KEY, NOT NULL | Links to the Transport\_Requests table. |
| vehicle\_id | INT | FOREIGN KEY, NOT NULL | Links to the Vehicles table. |
| driver\_id | INT | FOREIGN KEY, NOT NULL | Links to the Drivers table for the driver of this specific trip. |
| assignment\_date | DATETIME | NOT NULL | Date and time the vehicle was assigned. |
| planned\_start\_time | DATETIME | NOT NULL | The scheduled start time for the transport. |
| planned\_end\_time | DATETIME | NULL | The scheduled end time for the transport. |
| actual\_start\_time | DATETIME | NULL | The actual departure time. |
| actual\_end\_time | DATETIME | NULL | The actual arrival time. |
| assignment\_status | VARCHAR(50) | NOT NULL | Status of the assignment (e.g., "Scheduled," "Ongoing," "Completed"). |

Supporting tables

Customers

Stores information about the customers making transport requests.

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Constraint | Description |
| customer\_id | INT | PRIMARY KEY | Unique identifier for each customer. |
| name | VARCHAR(255) | NOT NULL | The customer's name. |
| contact\_number | VARCHAR(50) | NOT NULL | The customer's contact information. |
| email | VARCHAR(255) | NULL | The customer's email address. |
| address | VARCHAR(255) | NULL | The customer's address. |

Drivers

Maintains records for all drivers in the fleet.

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Constraint | Description |
| driver\_id | INT | PRIMARY KEY | Unique identifier for each driver. |
| name | VARCHAR(255) | NOT NULL | The driver's name. |
| license\_number | VARCHAR(50) | UNIQUE, NOT NULL | The driver's license number. |
| contact\_number | VARCHAR(50) | NOT NULL | The driver's contact number. |
| employment\_status | VARCHAR(50) | NOT NULL | The driver's employment status. |

Items

Used to store details about the specific goods being transported in a request. This table relates to Transport\_Requests in a one-to-many relationship.

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Constraint | Description |
| item\_id | INT | PRIMARY KEY | Unique identifier for each item. |
| request\_id | INT | FOREIGN KEY, NOT NULL | Links to the Transport\_Requests table. |
| description | VARCHAR(255) | NOT NULL | Description of the item. |
| weight | DECIMAL(10,2) | NULL | Weight of the item. |
| volume | DECIMAL(10,2) | NULL | Volume of the item. |
| quantity | INT | NOT NULL | Quantity of the item. |

Schema relationships

One-to-Many: One Customer can make many Transport\_Requests.

One-to-One: Each Vehicle is usually assigned to one Driver at a time.

Many-to-Many: The relationship between Transport\_Requests and Vehicles is many-to-many and is resolved by the Vehicle\_Assignments junction table.

One-to-Many: One Transport\_Request can have many Items.